AF/JAW

TRANSMITTAL LETTER (General - Patent Pending)	Docket No. LVIP:108US

In Re Application Of: **Reinhard Lihl et al.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/734,566	December 12, 2003	Kenneth E. Peterson	24041	3724	1877

Title: **APPARATUS FOR CUTTING SPECIMENS HAVING AN AUTOMATIC PRESETTING APPARATUS**

COMMISSIONER FOR PATENTS:

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(1) Reply Brief Under 37 CFR 41.41
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

U.S. Patent Application No.: 10/734,566 Confirmation No.: 1877

Applicants: LIHL, Reinhard et al. Customer No.: 24041

Filed: December 12, 2003

For: APPARATUS FOR CUTTING SPECIMENS HAVING AN AUTOMATIC PRESETTING APPARATUS

TC/Art Unit: 3724

Examiner: PETERSON, Kenneth E.

Docket No.: LVIP:108US

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REPLY BRIEF UNDER 37 C.F.R. § 41.41

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Honorable Sir:

Appellants respectfully submit this Reply Brief in response to the Examiner's Answer dated April 11, 2007. The Reply is timely filed within the specified two month period.

A **Claims Appendix** begins on page 10 of this paper.

An **Evidence Appendix** begins on page 11 of this paper.

A **Related Proceedings Appendix** begins on page 12 of this paper.

STATUS OF CLAIMS

The application contained 20 claims.

Claims 1 and 8 have been canceled.

Claims 10-20 have been withdrawn.

Claims 2-7 and 9 stand as finally rejected.

Claims 2-7 and 9 are the subject of this Appeal.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether Claims 2-7 and 9 are non-obvious under 35 USC §103(a) to a person having ordinary skill in the art at the time the invention was made and therefore patentable over U.S. Patent No. 5,535,654 (Niesporek)?

2. Whether Claims 2-7 and 9 are non-obvious under 35 U.S.C. § 103(a) to a person having ordinary skill in the art at the time the invention was made and therefore patentable over U.S. Patent No. 4,532,838 (Söderkvist)?

ARGUMENT

1) Whether Claims 2-7 and 9 are non-obvious under 35 USC §103(a) to a person having ordinary skill in the art at the time the invention was made and therefore patentable over U.S. Patent No. 5,535,654 (Niesporek)?

a) Summary of the Rejection:

The Examiner rejected Claims 2-7 and 9 under 35 USC §103(a) as being unpatentable over U.S. Patent No. 5,535,654 (Niesporek) More specifically, the Primary Examiner asserted:

> The patent to Niesporek, et al. shows a microtome having most of the recited limitations including a sensing device (20, 44) controlling a feeder device (50) at different speeds (coarse speed, slicing speed). Niesporek determines the position of a sample relative to the blade via contact sensor (20) rather than a light barrier sensor. The Examiner noted that contact sensors and light barrier sensors are both very old as well known and also art recognized equivalents. When sensing the position of a workpiece or tool part, one of ordinary skill would know that he has a choice between a contact sensor and a light barrier sensor. Evidence of this can be seen in numerous patents. [See list below.] It would have been obvious to one of ordinary skill in the art to have modified Niesporek by making his contact sensor be a light barrier, since these are art recognized equivalents as set forth above, and also since light sensors (having no moving parts) are less likely to break.
>
> If there is any doubt about the efficacy of light barrier sensors within microtomes, Examiner noted that light barrier sensors have long been employed for various proposes with microtomes. Evidence of this can be seen in numerous patents. [See list below.]

Appellants respectfully request reversal of the Primary Examiner's rejection of Claims 2-7 and 9 for the additional reason set forth below.

b) Additional Arguments regarding the rejection of Claims 2-7 and 9 under Niesporek

1) The citation of the Nishimoto patent in combination with Niesporek is impermissible hindsight.

As noted in both Applicants' Appeal Brief and the Examiner's Answer, the primary Niesporek reference fails to teach or suggest all the limitations of the rejected claims, namely the locating of a light barrier between the ultramicrotome blade and the specimen to ascertain the spacing of a few micrometers between the knife and the specimen. To demonstrate motivation in the microtome arts to alter Niesporek to replace the mechanical contact delimiting switch with a light barrier, the Examiner listed a series of patents in the microtome arts teaching the use of light barriers in microtomes or ultramicrotomes. However, as noted by both Applicants and the Examiner, these references do not teach or suggest the use of a light barrier to replace the mechanical delimiting switch of Niesporek or even to recognize the problems that can develop with a contact switch.

The Examiner cites the Nishimoto '776 patent as demonstrating that a person of ordinary skill in the microtome arts would be motivated to combine the teachings of Niesporek with Nishimoto to render Claims 2-7 and 9 obvious. Applicants respectfully submit that the citation of Nishimoto is the result of impermissible hindsight in that it is not in the ultramicrotome field and does not solve the same problem as that solved by Applicants claimed invention. As noted previously, Nishimoto is concerned only with detecting the passing of a piece of meat, such as a ham, past a light sensor and is not related to the measurement of a gap between two components such as a knife blade and a specimen. As recited in Nishimoto, col. 5, lines 24-63, the slicing machine in Nishimoto is designed to automatically feed a piece of meat, such as a ham or a roast, to a slicing blade. The problem recognized by Nishimoto is that as the end portion of the piece of meat approaches the blade, the slice must be altered to accommodate the irregular shape. Nishimoto teaches the use of a light barrier placed some distance from the blade in order to detect when the end of the meat passes a certain point. After this passing, the light sensor(s) detect an empty space caused by the passing of the meat and activate a timing mechanism to

change the slicing parameters at a predetermined time after activation. Thus, the citation of Nishimoto is impermissible hindsight in that although it teaches a light sensor, it does not teach the measurement of a gap using a light sensor or in fact the existence of any gap at all between two components and appears to be cited simply because it teaches a functional relationship of some sort between a knife blade and a light sensor. The Examiner compares the meat and meat slices sliced by the machine disclosed in Nishimoto to the biological material sliced by a microtome or ultramicrotome and states that this would provide motivation to a person of ordinary skill in the microtome arts to use a light barrier to measure a gap between a knife blade and a specimen when there is no gap to be measured between the meat, analogous to the specimen, and slicer, analogous to the microtome blade or between any other components of the Nishimoto disclosure. Thus, the citation of Nishimoto with Niesporek is impermissible hindsight that asserts incorrectly commonality between a meat slicing knife and an ultramicrotome blade and between a light sensor that detects the passing of a piece of meat with measurement of a gap between a knife blade and an ultramicrotome specimen.

"If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious." In *re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Claims 2-7 depend from Claim 9 and thus incorporate all the limitations of that claim. Because, as discussed above, the combined Niesporek and Nishimoto patents fail to render obvious Claim 9, they also fail to render obvious Claims 2-7.

2. Whether Claims 2-7 and 9 are non-obvious under 35 U.S.C. § 103(a) to a person having ordinary skill in the art at the time the invention was made and therefore patentable over U.S. Patent No. 4,532,838 (Söderkvist)?

a) Summary of the Rejection

The Examiner rejected Claims 2-7 and 9 under 35 USC §103(a) as being unpatentable over U.S. Patent No. 4,532,838 (Söderkvist) More specifically, the Primary Examiner asserted:

> Söderkvist shows an ultramicrotome with most of the recited limitations including a knife (1), a knife holder (8, 10), a specimen holder (15), a

> linear feed device (col. 3, lines 11-15), and a light barrier with transmitter (3) and a receiver (9). Since Söderkvist is an ultramicrotome, be definition, it cuts slices thinner that 300 nanometers.
> In regards to claim 2, the light barrier crosses the height of the knife as seen in figure 1. With regards, to claims 3 and 5, Söderkvist's sensor is coupled to the knife holder. With regards, to claims 9 and 6, Söderkvist's light barrier extends perpendicular to the knife edge, as opposed to being parallel to the knife edge (claim 9) and stationary (claim 6). Söderkvist's light barrier is a rather complex system, involving mirrors, reflections, and transmitter adjustments. Examiner notes that it is much more common to employ a simple light barrier system, such as that seen in Jakobi '977 (lines 48-50, column 7), Nishimoto '766 (21, 22) or Mohr '866 (figure 6, parallel knife edge). It would have been obvious to one of ordinary skill in the art to have modified Söderkvist by employing the simpler stationary light barrier, as shown by Jakobi, Nishimoto, and Mohr, since these are art recognized equivalents known for the same purpose, and to have made it parallel to the knife edge, as seen in Mohr, in order to most accurately gauge the distance to contact.

Appellants respectfully request reversal of the Primary Examiner's rejection of Claims 2-7 and 9 for the reasons set forth below.

b) Additional arguments regarding the rejection of Claims 2-7 and 9 under Söderkvist

1) The citation of the Nishimoto patent in combination with Söderkvist is impermissible hindsight.

As noted in both Applicants' Appeal Brief and the Examiner's Answer, the primary Söderkvist reference fails to teach or suggest all the limitations of the rejected claims, namely the locating of a parallel light barrier between the ultramicrotome blade and the specimen to ascertain the spacing of a few micrometers between the knife and the specimen. To demonstrate motivation in the microtome arts to alter Söderkvist to replace the mechanical contact delimiting switch with a light barrier, the Examiner has listed a series of patents teaching the use of light barriers in microtomes or ultramicrotomes. However, as noted by both Applicants and the Examiner, these references do not teach or even suggest the use of a light barrier to replace the

mechanical delimiting switch of Söderkvist or even to recognize the problems that can develop with a contact switch.

The Examiner cites the Nishimoto '776 patent as demonstrating that a person of ordinary skill in the microtome arts would be motivated to combine the teachings of Söderkvist with Nishimoto to render Claims 2-7 and 9 obvious. Applicants respectfully submit that the combination of Söderkvist with Nishimoto is the result of impermissible hindsight in that Nishimoto not only not in the ultramicrotome field but also does not solve the same problem as that solved by Applicants claimed invention. As noted previously, Nishimoto is concerned only with detecting the passing of a piece of meat, such as a ham, past a light sensor and is not related to the measurement of a gap between two components such as a knife blade and a specimen. As recited in Nishimoto, col. 5, lines 24-63, the slicing machine in Nishimoto is designed to automatically feed a piece of meat, such as a ham or a roast, to a slicing blade. The problem recognized by Nishimoto is that as the end portion of the piece of meat approaches the blade, the slice must be altered to accommodate the irregular shape of the end piece. Nishimoto teaches the use of a light barrier placed some distance from the blade in order to detect when the end of the meat passes a certain point. After this passing, the light sensor(s) detect an empty space caused by the passing of the meat and activate a timing mechanism to change the slicing parameters a predetermined time after activation. Thus, the citation of Nishimoto is impermissible hindsight in that although it teaches a light sensor, it does not teach the measurement of a gap using a light sensor or in fact the existence of any gap at all between two components and appears to be cited simply because it teaches a functional relationship of some sort between a knife blade and a light sensor. The Examiner compares the meat and meat slices sliced by the machine disclose in Nishimoto to the biological material sliced by a microtome or ultramicrotome and states that this would provide motivation to a person of ordinary skill to use a light barrier to measure a gap between a knife blade and a specimen when there is no gap to be measured between the meat, analogous to the specimen, and the blade or between any other components of the Nishimoto disclosure. Thus, the citation of Nishimoto with Söderkvist is impermissible hindsight that asserts the commonality of a meat slicing knife and a ultramicrotome blade and a light sensor

that detects the passing of a piece of meat with measurement of a gap between a knife blade and an ultramicrotome specimen.

"If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious." In *re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Claims 2-7 depend from Claim 9 and thus incorporate all the limitations of that claim. Because, as discussed above, the combined Söderkvist and Nishimoto patents fail to render obvious Claim 9, they also fail to render obvious Claims 2-7.

CONCLUSION

For the reasons set forth above, Appellants respectfully submit that Claims 2-7 and 9 are not rendered obvious under 35 U.S.C. §103(a) to a person having ordinary skill in the art at the time the invention was made by the combined Niesporek and Nishimoto references and the combined Söderkvist and Nishimoto references.

Respectfully yours,

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Dated: June 11, 2007

CLAIMS APPENDIX

Reprinted herebelow are the claims involved in this appeal:

2. The ultramicrotome as defined in Claim 9, wherein the light barrier is arranged substantially at the height of the knife blade and at a defined spacing between the knife and the specimen.

3. The ultramicrotome as defined in Claim 9, wherein the light barrier is arranged in stationary fashion with respect to the knife or to the specimen.

4. The ultramicrotome as defined in Claim 9, wherein the light barrier comprises a transmitter of electromagnetic radiation, in particular a laser or an LED, and a receiver of electromagnetic radiation.

5. The ultramicrotome as defined in Claim 4, wherein the transmitter and the receiver are mechanically coupled to the knife holder or to the specimen holder.

6. The ultramicrotome as defined in Claim 5, wherein the transmitter and the receiver are mounted in stationary fashion, in a housing wall of the cutting apparatus.

7. The ultramicrotome as defined in Claim 9, wherein an alternating drive system for moving the specimen at different speeds is further provided in the cutting apparatus.

9. An ultramicrotome comprising: a knife, defining a knife edge, a knife holder for clamping the knife, a specimen holder for holding a specimen, a feed device for generating a relative linear motion between the knife and the specimen, a light barrier being arranged parallel to the knife edge and located between the knife and the specimen, the arrangement of the light barrier is such that the relative linear motion between the knife and the specimen penetrates the light barrier and thereby ascertains a spacing of a few micrometers between the knife and the specimen to prevent contact between the knife and specimen, and to facilitate the cutting of specimen sections that are 300 nanometers or less thick.

EVIDENCE APPENDIX

No additional evidence is being submitted with this reply.

RELATED PROCEEDINGS APPENDIX

Upon information and belief, no appeals or interferences are known to Appellants, which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.